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HMT ASSOCIATES, L.L.C.
DEPT. OF TRANSPORTATION
HMT ASSOCIATES

603 KING ST.
SUITE 300
ALEXANDRIA, VA 22314-3105

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E.A. ALTEMOS
PATRICIA J. QUINN

703-549-0727

FACSIMILE: 703-549-0728

WRITER'S DIRECT DIAL NUMBER
(703) 549-0727

October 28, 2002

Ms. J. Suzanne Hedgepeth
Director, Office of Hazardous Materials
Exemptions and Approvals
Research and Special Programs Admn.
U.S. Department of Transportation
400 7th Street, S.W.
Washington, D.C. 20590-0001

Dear Ms. Hedgepeth:

REQUEST FOR MODIFICATION
DOT-E 12782

On behalf of Air Liquide America L.P. (formerly Air Liquide America Corporation), this is to request a modification to DOT-E 12782 to authorize plastic valve protection caps on certain Division 2.2 materials with a Division 5.1 subsidiary hazard, subject to cylinder valve protection requirements under 49 CFR 173.301(h); and Division 2.3 Hazard Zone A and B materials, subject to 49 CFR 173.40; and Division 2.3 Hazard Zone C and D materials subject to 173.301(h). This exemption currently permits the use of plastic valve protection caps on DOT specification cylinders containing Division 2.1 materials.

Because of the recent final rule for HM-220D, sections 173.301(h) and 173.40(d) now require use of valve protection caps made of metal. Prior to this rulemaking, Division 2.2 materials with a Division 5.1 subsidiary hazard were not subject to valve protection requirements, and for poisonous materials (including Division 2.3) subject to 173.40, a protective cap made of metal was not specified, only that the protective cap used be sufficient to protect the valve from deformation and breakage when subject to a 7 foot drop test.

Air Liquide proposes to use protective caps made of plastic on DOT specification cylinders containing oxygen and nitrous oxide, both classed as Division 2.2 materials with a subsidiary 5.1 hazard and now subject to 173.301(h); and Division 2.3, Hazard Zone A and B materials subject to 173.40; and Division 2.3 Hazard Zone C and D materials subject to 173.301(h). The proposed cylinder caps were subjected to and successfully passed a 7 foot drop test and have already been approved for Division 2.1 gases under DOT-E 12782.

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1. **Applicant:** Air Liquide America L.P., 2700 Post Oak, Houston, Texas, 77056, Contact person: Ralph Diaz, telephone: 713-499-6867. Please direct any questions concerning this application to the undersigned at 703-549-0727.

2. **Hazardous Materials Description:** *adding*

Nitrous oxide, 2.2, UN1070;

Oxygen, 2.2, UN1072; and

Division 2.3, Hazard Zone A and B materials, subject to 173.40 and Division 2.3 Hazard Zone C and D materials, subject to 173.301(h).

3. **Regulations from Which Exempted:**

49 CFR § 173.301(h)(2)(i) and 173.40(d)(2), in that protective caps made of plastic are authorized.

Note that the reference to 49 CFR 173.301(g) in paragraph 4 (regulations from which exempted) of the current exemption is no longer valid due to changes in the regulations under HM-220D. The reference should be updated to show the correct paragraph as 173.301(h), which now addresses cylinder valve protection requirements. ✓

4. **Modes of Transportation Authorized:** Highway

5. **Equivalent Level of Safety:**

Included in the the original application for DOT-E 12782, Air Liquide submitted test reports in which a series of 7 foot drop tests were conducted on cylinders equipped with the proposed plastic caps. Test reports revealed that the plastic caps provided sufficient protection in that there was no deformation, breakage or leakage to the cylinder valve. A copy of those test reports are already on file with the Office of Hazardous Materials Exemptions and Approvals, however, we are enclosing a copy with this application for your convenience. To summarize the test reports, six cylinders equipped with the plastic valve cap were dropped from a height of seven feet at an angle that would cause the greatest damage upon impact. The tests revealed that the cylinders exhibited minor damage to the protective collars and slight damage to several of the cylinder valves which was limited strictly to the hand wheel. In no case were the valves broken, nor was there any pressure loss or leakage detected from any of the cylinders tested.

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Air Liquide believes the tests results have demonstrated that the plastic protective caps provide adequate protection to the cylinder valve and would provide a level of safety equivalent to the metal caps required under 173.301(h)(2)(i) and 173.40(d)(2), in that the plastic caps would provide sufficient strength in protecting the valves on cylinders containing oxygen, nitrous oxide and Division 2.3, Hazard Zone A and B materials subject to 173.40; and Division 2.3 Hazard Zone C and D materials subject to 173.301(h).

In summary, Air Liquide submits that the packaging proposed herein will ensure that transport under the requested modification will afford a level of safety in transport at least equivalent to that afforded by the regulations.

If you have any questions, please contact the writer at (703)549-0727.

Sincerely,

A handwritten signature in cursive script, appearing to read "Pat Quinn".

Patricia A. Quinn

Enclosures

ARROWHEAD INDUSTRIAL SERVICES, INC.
3537 SNC HWY 119
GRAHAM NC, 27253

REPORT OF FINDINGS

CLIENT:

AIR LIQUIDE

TESTING PERFORMED:

Drop tests performed in accordance with 173.40 (d),(2) and additional in house guidelines.

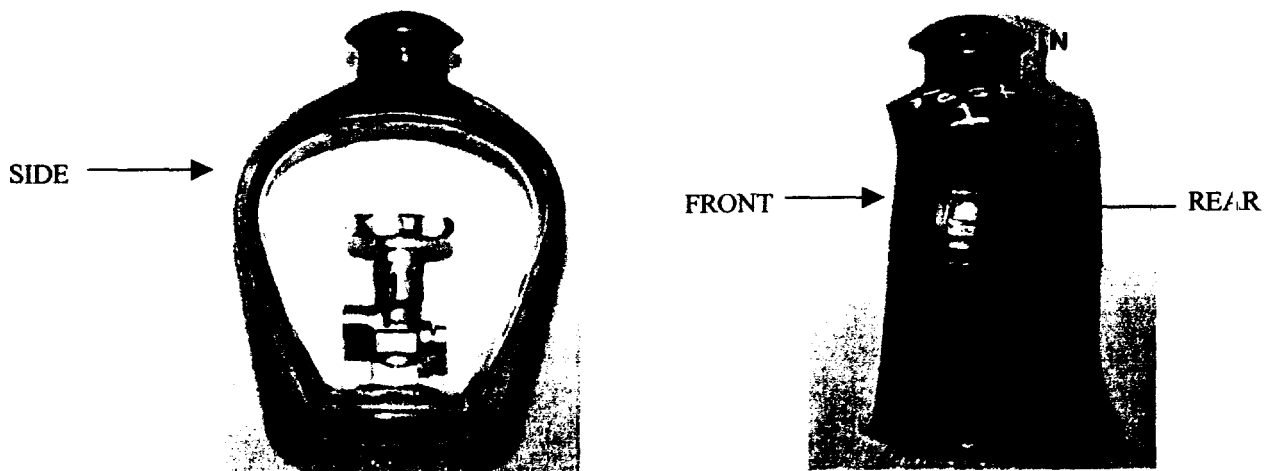
PROCEDURE:

Testing was performed on six (6) cylinders approximately nine inches in diameter and fifty-five inches in height. Cylinders were filled with water to a weight of 209.5 lbs and then a valve was installed. After installing valves, cylinders were filled with nitrogen to a pressure of 30 pounds per square inch. A leak check solution was then applied to the valve and neck to verify the absence of leaks. Protective collars were then threaded onto the neck of each cylinder and secured in place.

Each cylinder was suspended at a height of 7 feet at an angle of 30°. The orientation of each cylinder was such as to cause the maximum amount of damage to the valve and collared portion of each cylinder when dropped onto a concrete of similar surface. (See orientation diagram below.) After each test, photographs were taken of each collar and valve and damage, if any was noted. (See attachments)

CONCLUSION:

All six test units exhibited some minor collar damage and valve damage, limited to the hand wheel. All six test units were examined for pressure loss approximately 30 minutes after each test was conducted. There was no evidence of pressure loss in any of the specimens. It should be concluded that the valve protection device (scandina cap) provided adequate protection when dropped from this height.




Raymond Crouch (Technical Representative)


Chris Martin (Quality Assurance Director)



CYLINDER CHARACTERISTICS

Drop Test #1

Serial Number: 40445

Orientation: front impact

*Minor collar damage

Date:

6-8-01

Inspector:

R. Cran



CYLINDER CHARACTERISTICS

Drop test #2

Serial Number: TX-36222

Orientation: Side impact

*Minor collar and valve damage

Date:

6-8-01

Inspector:

R. Cran



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PHOTOGRAPHIC RECORD OF TESTS



CYLINDER CHARACTERISTICS

Drop Test #3

Serial Number: 2256

Orientation: Rear impact

*Minor collar and valve damage



045

Date:

6-8-01

Inspector:

R. Brown



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PHOTOGRAPHIC RECORD OF TESTS



CYLINDER CHARACTERISTICS

Drop Test #4

Serial Number: 40081

Orientation: Side impact

*Minor collar and valve damage



045

Date:

6-8-01

Inspector:

R. Brown



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PHOTOGRAPHIC RECORD OF TESTS



CYLINDER CHARACTERISTICS

Drop Test #5

Serial Number: 113369

Orientation: Front impact

*Minor collar damage



045

Date:

6-8-01

Inspector:

R. Grant



CYLINDER CHARACTERISTICS

Drop Test #6

Serial Number: SPZ-3194

Orientation: Side Impact

*Minor collar and valve damage

Date:

6-8-01

Inspector:

R. Brown